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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,850	08/21/2003	Ping MEI	115252	1849

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EXAMINER	
ANYA, IGWE U	

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,850	MEI ET AL.	
	Examiner	Art Unit	
	Igwe U. Anya	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24,32-37,39 and 40* is/are rejected.

7)☒ Claim(s) *25-31,39 and 41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04062004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 9 – 14, and 21 – 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Chua et al. (US Patent 6396677).

3. Chua teach a microelectromechanical system (MEMS), based sensor (col. 15 lines 37 – 65) comprising:

a substrate defining a plane (14), a first conductive material layer (15) having a first stress, a first portion (12) of the first conductive material layer being connected to the substrate and extending in a substantially parallel direction to the plane defined by the substrate (fig. 6), a second portion (11) of the first conductive material layer being disconnected from the substrate and extending in a substantially non parallel direction to the plane defined by the substrate; and

a semi conductive material layer formed over at least the second portion of the first conductive material layer (col. 9 lines 61 - 67), the semi conductive material layer having a second stress that is, less than the first stress of the first conductive material layer, wherein the first and second stresses form a stress gradient that bends the second portion of the first conductive material layer and the sensor material layer formed over the second portion of the first conductive material layer away from the

substrate, and further comprising a second conductive material layer formed over the semiconductor material layer, wherein at least a partial sub-layer of the semiconductor material layer that is remote from the first conductive material layer has a reduced stress that is less than the second stress. (col. 10 lines 20 - 46);

the second conductive material layer having a third stress that is less than the second stress of the semiconductor material layer; the first, second and third stresses forming a stress gradient that bends the second portion of the first conductive material layer, the sensor material layer formed over the second portion of the first conductive material layer and at least a portion of the second conductive material layer away from the substrate, wherein the first and second stresses are compressive stresses and the third stress is a tensile stress, thus forming a spring contact (col. 12 lines 1 – 42);

the conductive material comprising molybdenum-chromium (col. 16 lines 29 – 36); and

a back plate having a planar surface on which first and second semiconductor chips are mounted, and the chips communicate through the spring contact and wherein the back plate comprises a printed circuit board (col. 15 lines 33 – 43).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3 – 5, and 15 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chua et al. (US Patent 6396677) in view of Street et al. (US Patent 6429417).

7. Chua et al. teach the features previously outlined, but lack the spring contact semiconductor composed of material selected from a group consisting of polysilicon, amorphous silicon, and hydrogenated amorphous silicon that can be used being as sensing member in a probe card.

8. However, Street et al. teach a sensor material selected a group consisting polysilicon, amorphous silicon, and hydrogenated amorphous silicon (col. 4 line 61 – col. 5 line 9).

9. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Street et al. into the Chua et al. reference to form a highly transmissive sensor.

10. Claims 6, 7, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chua et al. (US Patent 6396677) in view of Grudkowski et al. (US Patent 6300706).

11. The Chua reference teaches the features previously outlined, but lacks the sensor comprising Group III –V semiconductor material and gallium arsenide.

12. However, Grudkowski et al. teach a sensor comprising Group III –V semiconductor material and gallium arsenide (col. 2 lines 25 – 39).

13. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Grudkowski et al. into the Chua et al. reference to form a piezoelectric sensor with enhanced sensitivity.

14. Claims 8, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chua et al. (US Patent 6396677) in view of Biegelsen (US Patent 6267605).

15. The Chua reference teaches the features previously outlined, but lacks the conductive material comprising of titanium- tungsten material.

16. However, Biegelsen teach a conductive spring material comprising of a tungsten-based alloy for elasticity (col. 4 line 61 – col. 5 line 9).

17. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Biegelsen into the Chua reference to form an elastic conductor.

18. Claims 32 – 37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chua et al. (US Patent 6396677) in view of Miracky et al. (US Patent 6636653).

19. The Chua reference teaches the features previously outlined, but lacks a chip to chip communication comprising emitting optical signals by optical scanner or laser array from the first chip and receiving the signals using an array of MEMS signals on the second chip, a collimation lens array associated with the laser array of the first semiconductor chip, in-line calibration for optical link, and the laser array selected from a group comprising an edge emitting laser array and a VCSEL laser array.

20. However, Miracky et al. teach a chip to chip communication comprising emitting optical signals by optical scanner or laser array from the first chip and receiving the signals using an array of MEMS signals on the second chip (figs. 14 – 15B), a collimation lens array associated with the laser array of the first semiconductor chip (725), in-line calibration for optical link (col. 10 lines 48- 54), and the laser array selected from a group comprising an edge emitting laser array and a VCSEL laser array (col. 19 line 57 – col. 20 line 12).

21. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Miracky et al. into the Chua reference to form a monolithic integrated Optical MEMS.

22. Claims 25 – 31, 38, and 41 are objected to as being dependent upon a rejected claim, but would be allowable if rewritten in independent form.

23. Prior art considered, but not used in the rejection include Lemmi et al (USPAB 20030057533).

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igwe U. Anya whose telephone number is (571) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya
Examiner
Art Unit 2825

IA

May 19, 2004

MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800